

REMARKS

I. Status and Disposition of the Claims

Prior to the above amendment, claims 19-42 were pending in this application. By the above amendment, claims 19, 21, 25-28, and 30 are amended, and claims 24, 29 and 42 are cancelled. Thus, claims 19-23, 25-28, and 30-41 are now pending and under consideration on the merits.

Independent claim 19 has been amended to incorporate the elements of cancelled claims 24 and 29 and to recite, "wherein the opaque medium provides a visual background for the reaction product of said radical initiator and said at least one dye substance." Claims 21, 25-28, and 30 have been amended so as to maintain strict antecedent basis. Support for these amendments may be found in the as-filed specification and claims, for example, at page 2, lines 14-23 and page 4, lines 10-22 of the as-filed specification. Accordingly, these amendments raise no issue of new matter.

Applicants thank the Examiner for withdrawing the rejection of claim 42 under 35 U.S.C. § 102(a) as anticipated by Japanese Publication No. 2002-129055 ("Fujita"); the rejection of claims 19-22, 29, 31-34 and 36-39 under 35 U.S.C. § 103(a) as unpatentable over Canadian Patent No. 781,210 ("Buckland") in view of British Patent No. 1,147,875 ("Robert"), German Patent No. DE 19643995 ("Jenke"), and U.S. Pre-Grant Publication No. 2005/0087725 ("Kanakkanatt"); and the rejection of claim 30 under 35 U.S.C. § 103(a) as being unpatentable over Buckland, Robert, Jenke, and Kanakkanatt, and further in view of U.S. Patent No. 4,155,887 ("Hetson").

II. Response to Claim Rejections

In the Office Action, the Patent Office rejects:

- claim 42 under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 5,340,53t to Barrett ("Barrett") or U.S. Patent No. 3,966,414 to Khattab et al. ("Khattab") (Office Action, page 2-3);
- claims 19-23 and 29-41 under 35 U.S.C. § 103(a) as allegedly unpatentable over Canadian Patent No. CA 781,210 to Buckland ("Buckland") in view of Barrett, German Patent No. DE 196 43 995 to Jenke ("Jenke"), and U.S. Pre-Grant Publication No. 2005/0087725 to Kanakkanatt ("Kanakkanatt") (See *id.* at 3-6); and
- claims 19-22, 24-28, and 41 under 35 U.S.C. § 103(a) as allegedly unpatentable over Buckland in view of Khattab, Jenke, and Kanakkanatt (See *id.* at 6-9).

Inasmuch as these rejections pertain to claims 24, 29, and 42 they are moot, as those claims are now cancelled. With respect to pending claims 19-23, 25-28, and 30-41, Applicants respectfully disagree with and traverse each of these rejections for at least the following reasons.

A. 35 U.S.C. § 102(b) rejections of claim 42 in view of Barrett or Khattab

According to the Office, Barrett and Khattab anticipate each and every element of claim 42 for the reasons set forth at pages 2 and 3 of the Office Action. These rejections are now moot, as claim 42 is now cancelled. Accordingly, withdrawal of these rejections is respectfully requested.

B. 35 U.S.C. § 103(a) rejection of claims 19-23 and 29-41 in view of Buckland, Barrett, Jenke, and Kanakkanatt

The Office alleges that claims 19-23 and 29-41 are unpatentable over Buckland, Barrett, Jenke, and Kanakkanatt for the reasons set forth at pages 3 to 6 of the Office Action. This rejection is moot with respect to claim 29, as that claim is now cancelled.

As to pending claims 19-23 and 30-41, Applicants respectfully disagree with and traverse this rejection for at least the following reasons.

Several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims of a patent application under 35 U.S.C. § 103. These factual inquiries, as set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or non-obviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. at 467; see also *KSR Int'l Co. v. Teleflex Inc.*, 82 U.S.P.Q.2d 1385 (2007) and M.P.E.P. §2141 (Rev. 6, Sept 2007).

The Supreme Court in *KSR* also held that “[t]here is no necessary inconsistency between the idea underlying the TSM [teaching, suggestion, motivation] test and the *Graham* analysis.” M.P.E.P. §2141 (rev. 6, Sept. 2007), citing *KSR* at 82 U.S.P.Q. 2d at 1396. Applicants understand this to mean that when applicable, as here, TSM reasoning may still be applied not only by an examiner, but also by Applicants to refute a §103 rejection.

With the above in mind, amended claim 19 recites, *inter alia*,

[a] cured pneumatic tyre, comprising. . . at least one temperature indicator; wherein the at least one temperature indicator comprises. . . at least one radical initiator; at least one dye substance; and an opaque medium. . . wherein the

at least one radical initiator has a threshold temperature. . . wherein, when an excess temperature is reached in the cured pneumatic tyre, the at least radical initiator is heated above the threshold temperature and chemically reacts with the at least one dye substance so as to irreversibly modify. . . at least one characteristic peak [of the at least one dye substance]; and wherein the opaque medium provides a visual background for the reaction product of said radical initiator and said at least one dye substance.

Claim 19. As discussed below, Buckland, Barrett, Jenke, and Kanakkanatt each fail to teach or even suggest a cure pneumatic tyre comprising the claimed at least one temperature indicator and opaque medium. *See id.*

Buckland is drawn towards the use of temperature indicators as a means for determining whether a green (i.e., uncured) tire is exposed during production to heat that is sufficient to cure the rubber making up the tire. See Buckland, page 4, lines 10-25. Specifically, Buckland employs a strip of temperature indicating material during the formation of a tire. *Id.* at page 6, line 28-page 7, line 5. If the indicator is exposed to a desired temperature (e.g., a desired curing temperature) it changes color, thereby allowing operators to easily determine if satisfactory curing of the tire has occurred. *Id.* at page 6, line 28-page 7 line 5.

Among other things, however, Buckland does not disclose a temperature indicator comprising at least one radical initiator, at least one dye substance, and an opaque medium, as claimed. See claim 19. In particular, Buckland fails to disclose a temperature indicator comprising at least one radical initiator. Rather, Buckland only generally mentions that "substances that are supplied by paint manufacturers specializing in the heat indicator field" are suitable. Buckland, page 4. Applicants submit, however, that this broad disclosure does not provide one of ordinary skill with a

an understanding that temperature indicators comprising at least one radical initiator, as claimed, may exist, or b) any impetus to select and use such a temperature indicator comprising at least one radical initiator.

The secondary references (Barrett, Jenke, and Kanakkatt) cited by the Office do not cure the deficiencies of Buckland. Barrett relates to moisture stable temperature indicating compositions that produce a visible and permanent color change upon exposure to a predetermined heat history. See Barrett, column 1, lines 5-8. These temperature indicators comprises a dispersion of a color changing electron donating compound and a polymeric electron accepting resin. See *id.* at column 2, lines 56-60. Above a certain temperature, the electron donating compound and the electron accepting compound react to produce a visible color change. See *id.* at lines 61-62. However, Barrett is completely silent with respect to a temperature indicator comprising at least one *radical initiator* as claimed.

Jenke, like Buckland and Barrett, also fails to teach of even suggest the claimed cured pneumatic tyre. Jenke generally discusses monitoring tire temperature by applying a temperature indicator to the side walls of a tire. See Jenke translation, page 1, paragraph 4. However, Jenke is completely silent with respect to the use of a temperature indicator comprising a reactive substance and a dye substance, wherein "the. . . reactive substance. . . **chemically** reacts with the. . . dye substance so as to **irreversibly** modify the at least one characteristic peak[.]" as claimed. See claim 19 (emphasis added). Furthermore, Jenke makes no mention of temperature indicators comprising at least one radical initiator, as claimed. As such, Jenke's indicators are

clearly different from the claimed temperature indicators, which include at least one radical initiator, and exhibit an irreversible change. See Claim 19.

Finally, Kanakkanatt relates to a “thermochromic tire or material in part thereof which **reversibly** changes color with temperature.” Kanakkanatt, paragraph [0013] (emphasis added). Furthermore, Kanakkanatt is silent with respect to a temperature indicators comprising at least one radical initiator, as claimed. Thus, Kanakkanatt’s indicators are clearly different from the claimed temperature indicators for essentially the same reasons as stated above with respect to Jenke’s indicators.

For at least the foregoing reasons, Buckland, Barrett, Jenke, and Kanakkanatt do not teach or even remotely suggest a cured pneumatic tire comprising at least one temperature indicator as claimed. See claim 19. In particular, none of these references teach or even suggest a temperature indicator comprising at least one radical initiator, wherein the indicator exhibits an irreversible color change when an excess temperature is reached in the tyre. Thus, Applicants respectfully submit that the § 103(a) rejection of claims 19-23 and 30-41 is improper, and should be withdrawn.

C. 35 U.S.C. § 103(a) rejection of claims 19-22, 24-28, and 41 in view of Buckland, Khattab, Jenke, and Kanakkanatt

The Office alleges that claims 19-22, 24-28 and 41 are unpatentable over Buckland, Khattab, Jenke, and Kanakkanatt for the reasons set forth at pages 6 to 9 of the Office Action. This rejection is moot with respect to claim 24, as that claim is now cancelled. As to pending claims 19-22, 25-28 and 41, Applicants respectfully disagree with and traverse this rejection for at least the following reasons.

The deficiencies of Buckland, Jenke, and Kanakkanatt with respect to the pending claims are largely discussed above in section II(B). In essence, these references fail to teach or even suggest a tyre comprising at least one temperature indicator comprising at least one radical initiator, as claimed, and/or at least one dye substance that exhibits a permanent color change, as claimed. See claim 19. In addition to the above described defects, Buckland, Jenke, and Kanakkanatt also fail to disclose a tyre comprising at least one temperature indicator, wherein the temperature indicator comprises, *inter alia*, an opaque medium, as claimed. See *id.*

Khattab fails to cure these deficiencies. Khattab is drawn to temperature indicators comprising a free-radical sensitive dye and an organic peroxide. See Khattab, column 2, lines 24-47. The dye and peroxide are supported on an inert carrier. See *id.* at column 3, lines 27-34. When the dye and peroxide are combined, a color change results as the thermal decomposition of the peroxide produces radicals which attack the dye. See *id.* at column 3, lines 35-45.

Khattab is silent, however, with respect to applying its disclosed temperature indicators on or with a cured pneumatic tyre. Rather, Khattab is primarily concerned with the application of such indicators on food storage systems, e.g., as a means for determining how long frozen food items have been exposed to an elevated (e.g., greater than 0° C) temperature. See *id.* at column 1, lines 34-37, column 3, lines 45-62, and column 4, lines 5-36. Furthermore, Khattab makes no mention of incorporating an opaque medium into its temperature indicators for any purpose.

For at least the foregoing reasons, Applicants respectfully submit that Buckland, Khattab, Jenke, and Kanakkanatt, alone or in combination, fail to establish a *prima facie*

case of obviousness with respect to the currently pending claims. Indeed, these references provide no disclosure that explains a) *why* one of ordinary skill in the art would decide to apply an irreversible color changing material to a *cured* pneumatic tyre; b) *why* one of ordinary skill would specifically select Khattab's temperature indicators from the myriad other indicators known in the art, particularly when Jenke suggests other (non-radical initiator based) indicators as being suitable for tyre applications, whereas Khattab is silent with respect to such applications; and c) *why* one of ordinary skill would combine an opaque medium with the temperature indicators of Khattab, given that none of the references teach or even suggest such a combination. Without providing evidence of a reason why a person of ordinary skill in the art would make these decisions, there can be no motivation to combine the references and certainly no reasonable expectation of success from doing so.

Thus, Applicants respectfully submit that the applied 35 U.S.C. § 103(a) rejection of claims 19-22, 24-28, and 41 in view of Buckland, Khattab, Jenke, and Kanakkanatt is improper, and should be withdrawn.

III. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account no. 06-0916.

Respectfully submitted,

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